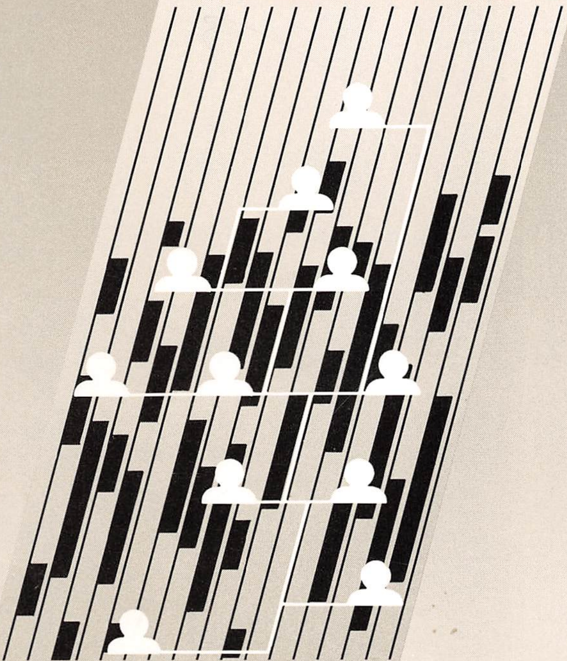
NESTAR



PLAN SERIES™

PERSONAL COMPUTER-
BASED
LOCAL AREA
NETWORKS

PLAN 5000

Installation Guide

NESTAR SYSTEMS, INCORPORATED

PLAN 5000^{TM}

INSTALLATION MANUAL

NOTICE:

Nestar Systems, Incorporated reserves the right to make improvements to the product described in this manual at any time and without notice.

PLAN ™ Series is a trademark of Nestar Systems, Incorporated.

WARNING

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the manufacturer's instructions, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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CONTENTS

Introduction 1

Installing the Network

Overview 5
Requirements 6

Unpacking the Equipment

Unpacking the File Server 7
Unpacking the Apple and IBM PC Workstations 8

Addressing the NIC

Setting the Address 8
Shunts 9
Switches 11

Installing the NIC 12

Connecting a Console to the File Server Cabinet 13

Powering on the File Server 14

Cabling the Network

Cable Placement and Cabling Rules 16
Walls, Floor, Ceilings 19
Connecting Workstations and HUBs 20

Checking the System

Testing the File Server 22
Testing User Stations 23

Backing Up the System

Inserting Tape Cartridges 25

Other Servers 26

INTRODUCTION

The PLAN Series offers a set of fast, expandable, local area computer networks. Connecting a variety of desktop workstations, these networks allow users to communicate with each other and to share data, mass storage, and other network resources.

This manual describes how to install your PLAN Series network. The body of the manual assumes that you are installing a network consisting of

- a PLAN 5000 file server with one hard disk, running version 2.3 software or higher
- active and passive HUBs cabled using coax cables
- an IBM PC workstation

If you are installing PLAN Series equipment or software other than this, or if you require further information, refer to the following PLAN Series reference manuals:

General Information Manual for an overview of the network

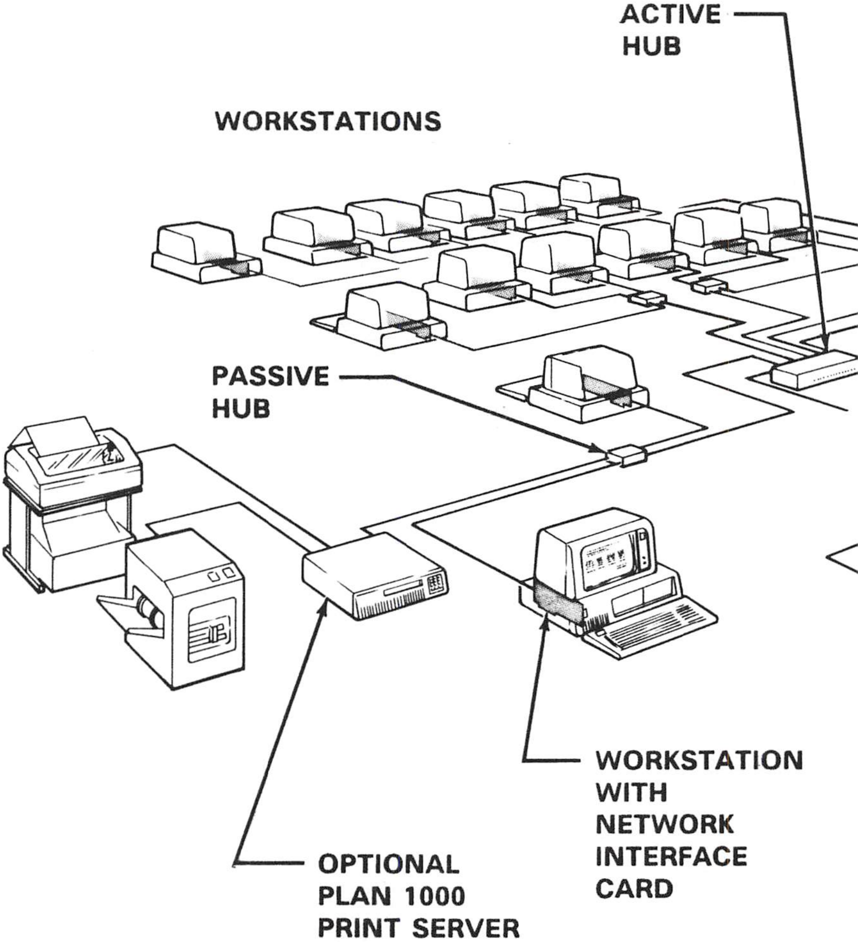
Physical Planning Manual for file server and user hardware layout

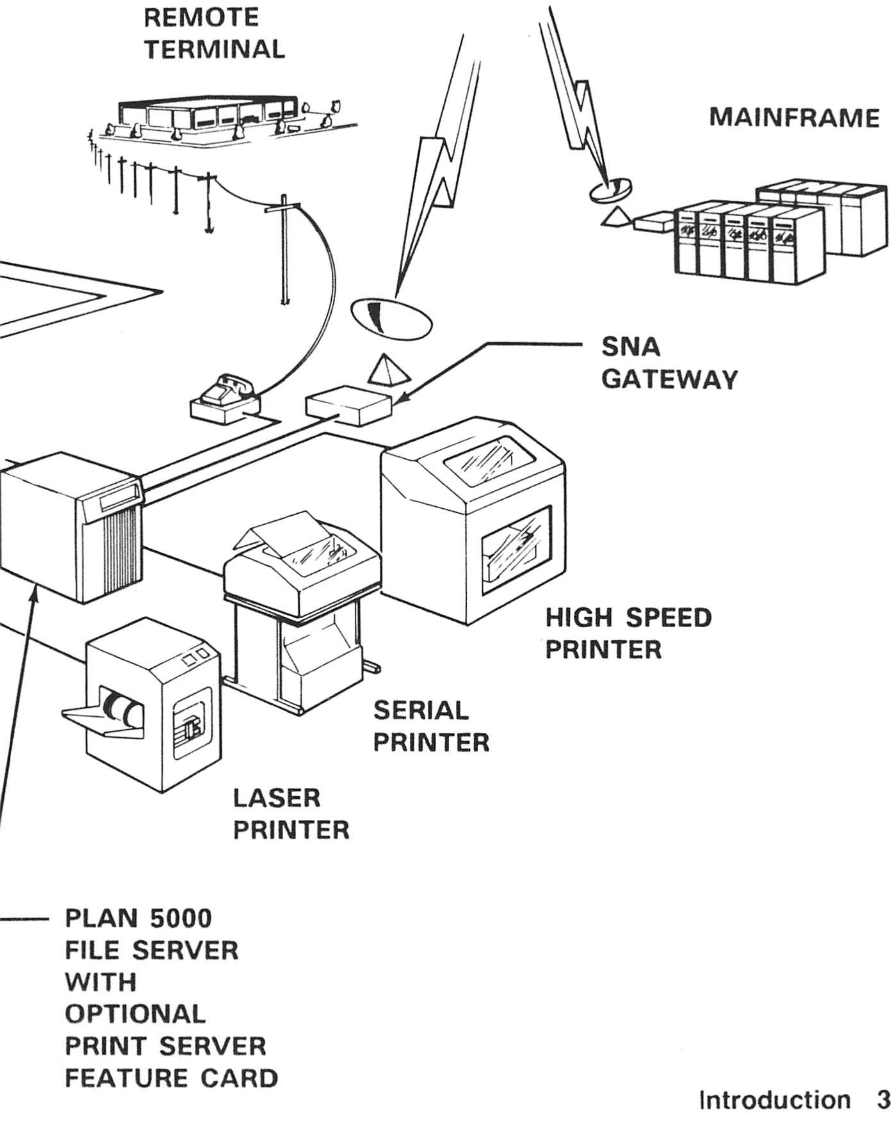
Network Installation Manual for additional information on cabling, Print Server Feature Cards, and other aspects of network installation

File Server Installation and Operation Manual for file server and user software facilities

File Server General Index

PLAN 5000 NETWORK


ACTIVE HUB
WORKSTATIONS
PASSIVE HUB
WORKSTATION WITH NETWORK INTERFACE CARD
OPTIONAL PLAN 1000 PRINT SERVER


REMOTE
TERMINAL
MAINFRAME
SNA
GATEWAY
HIGH SPEED
PRINTER
SERIAL
PRINTER
LASER
PRINTER
PLAN 5000
FILE SERVER
WITH
OPTIONAL
PRINT SERVER
FEATURE CARD

Complete information on user workstations is found in these PLAN Series manuals:

Network Command Reference Manual, which provides information on shared hard disks, security, and network commands that applies to all supported microcomputer environments.

IBM PC Reference Manuals, which provide information on each workstation environment. Information includes starting up, sharing hard disks and printers, network utilities, and using networked application programs.

INSTALLING THE NETWORK

Overview

To install your network, you must

(1)	Unpack the equipment	Page 7
(2)	Address the NICs	Page 8
(3)	Install the NICs	Page 12
(4)	Connect a console to the file server cabinet	Page 13
(5)	Power on the file server	Page 14
(6)	Cable the file server, other servers, and workstations together via HUBs	Page 16
(7)	Check the system	Page 22
(8)	Back up the file server	Page 25

Requirements

Your network consists of the following equipment:

- at least one file server, containing at least one hard disk
- optional, additional servers, printers, and other peripherals
- network cable
- at least one HUB
- up to 255 IBM PCs, XTs, ATs, and Apple //s

Your IBM PC must have:

- ROM BIOS later than 10/19/81
- a Network Interface Card (NIC) installed

To install the network you need:

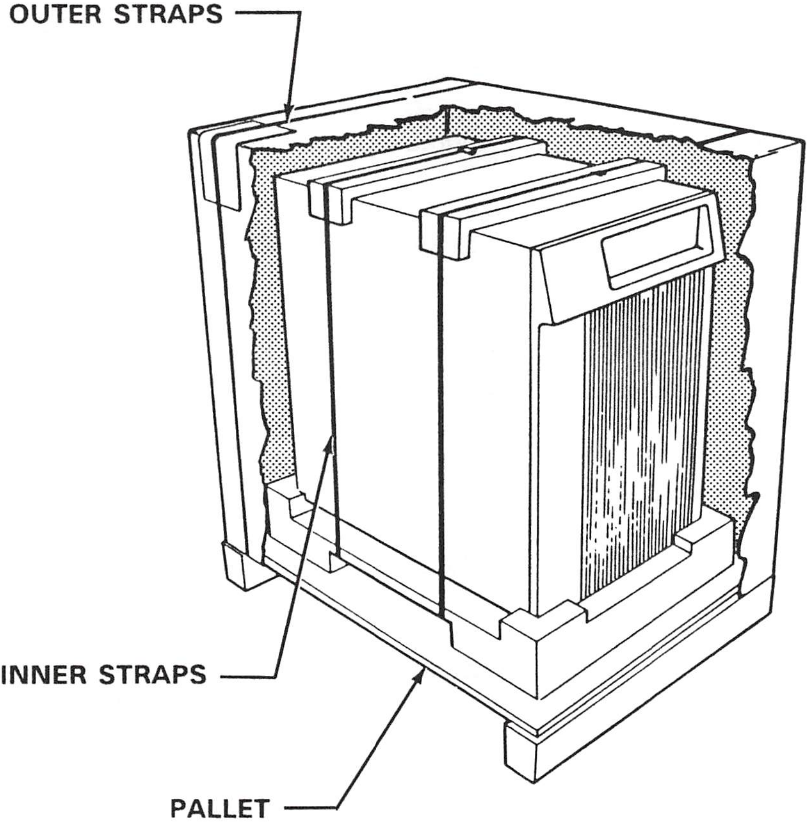
- a sharp object, such as a standard office push-pin, to break address shunts (if present instead of switches) on the NICs
- a medium, flat head screwdriver, to remove workstation covers

UNPACKING THE EQUIPMENT

Unpacking the File Server

The file server, power cord, and packing list arrive in a carton. Documentation, Network Interface Cards, network cable, and software and diagnostics on tape will arrive in separate cartons.

Before unpacking your file server, read the unpacking instructions. The PLAN 5000 weighs either 105 or 145 pounds (depending on whether it has one or two hard disks).



Unpacking the Apple and IBM PC Workstations

Unpack your Apple and IBM PCs and perform normal standalone hardware installation as described in the appropriate IBM or Apple manual Make sure that the computers are functioning correctly as standalone workstations before proceeding.

ADDRESSING THE NIC

Each workstation and server on the network must have a Network Interface Card (NIC); file server NICs are called Peripheral Interface Cards (PICs). Every NIC or PIC has an address shunt or switch box that defines the address for that station.

Each station **must** have a unique address programmed on its NIC address shunt or switch box.

Warning: Turn off the computer before inserting or removing the card.

Setting the Address

All NICs are preset to hex address $00 and PICs are preset to $FE.

If any stations have address $00, the network will not work. All stations must use NICs with non-zero station addresses (at least one shunt broken).

Nestar suggests that you number stations beginning with number 1, that labels be placed on the cards to indicate station number, and that a record be kept of user station locations and numbers. Having more than one station on the network (or on connected networks) with the same address will not cause physical damage, but will result in a variety of network and file server problems that may be difficult to diagnose.

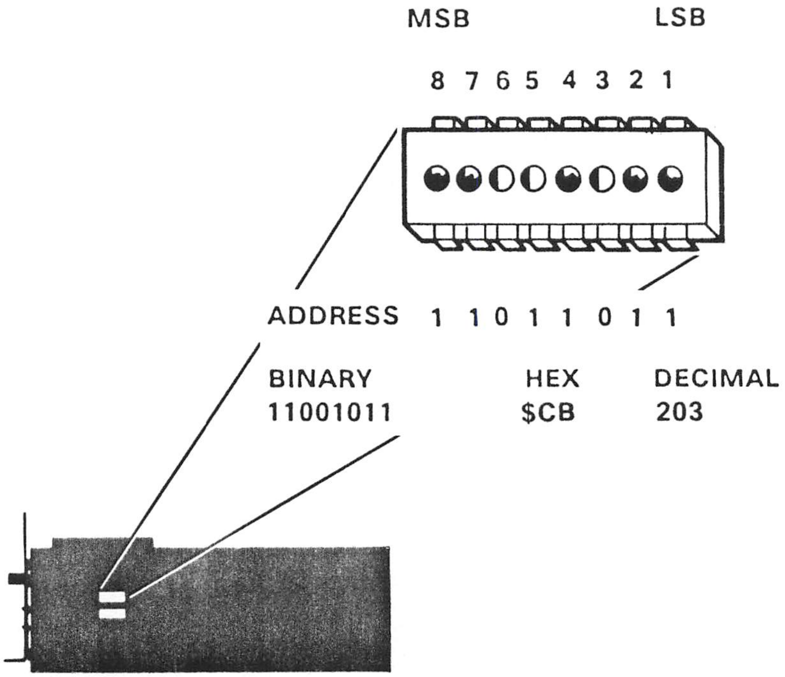
Shunts

When a NIC or PIC has shunts instead of switches, the address is set by breaking a shunt when a 1 is desired (the 8 positions on the shunt represent either a binary 0 or 1). A small sharp tool can be used to break the shunt; a standard office push-pin works quite well.

Shunts are numbered 0 through 7; 0 is the least significant bit (LSB) and 7 is the most signficant bit (MSB). For example, if shunts 0, 1, 3, 6, and 7 are broken the address for that station would be 11001011 binary, or $CB hexadecimal, or 203 decimal (see figure on next page).

Addresses from $1 to $FF can be used by user and server stations.

~~For IBM PC NICs~~, hold the card with the edge Switch connector at the upper left. The bottom shunt is the ~~shunt~~ that determines the station address. The board has either 7 and 0 or MSB and LSB to indicate bit 7 and bit 0. Break ~~the appropriate~~ shunts to set that ~~station's address~~.

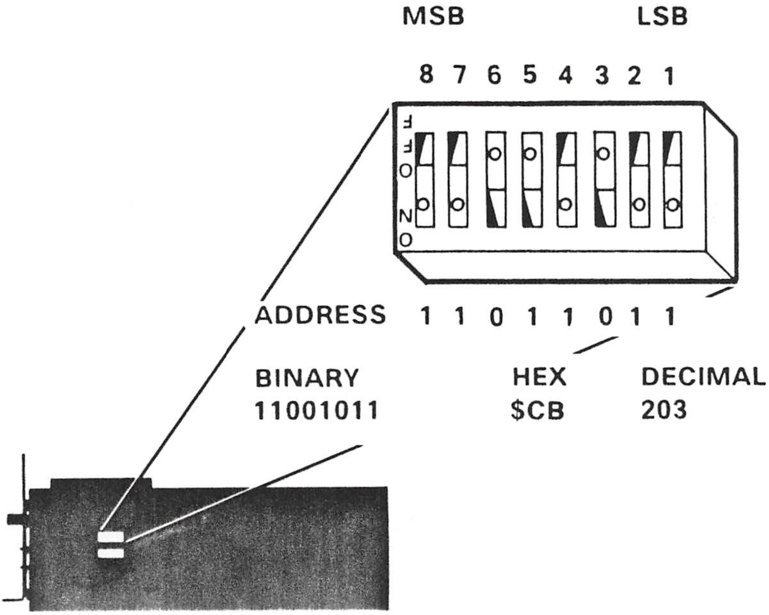

MSB
LSB
8 7 6 5 4 3 2 1
ADDRESS 1 1 0 1 1 0 1 1
BINARY
11001011
HEX
$CB
DECIMAL
203

Switches

When a NIC or PIC has switches, the address is set by pushing each switch to an ON or OFF position. A switch setting of ON represents binary 0 and a switch setting of OFF represents binary 1.

The switches are numbered 1 through 8; 1 is the LSB and 8 is the MSB. Hold the board so that the numbers printed on the switch are upside down to set the switches correctly.

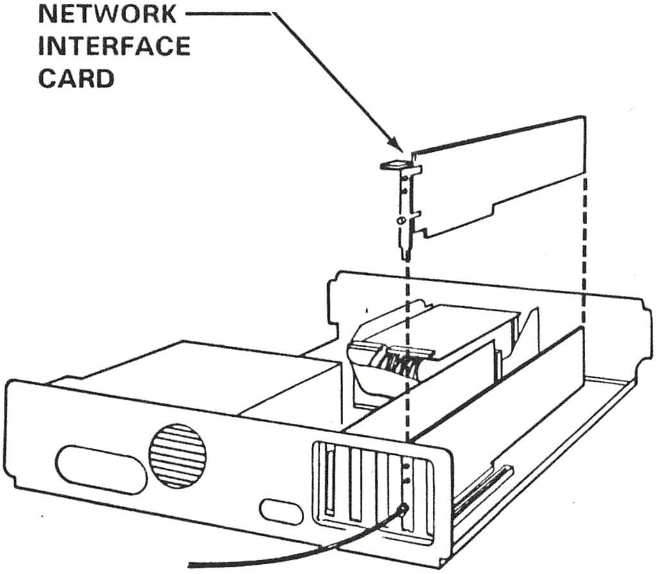
If switches 1, 2, 4, 7, and 8 are OFF the address would be 11001011 (binary), $CB (hexadecimal). or 203 (decimcal).



INSTALLING THE NIC

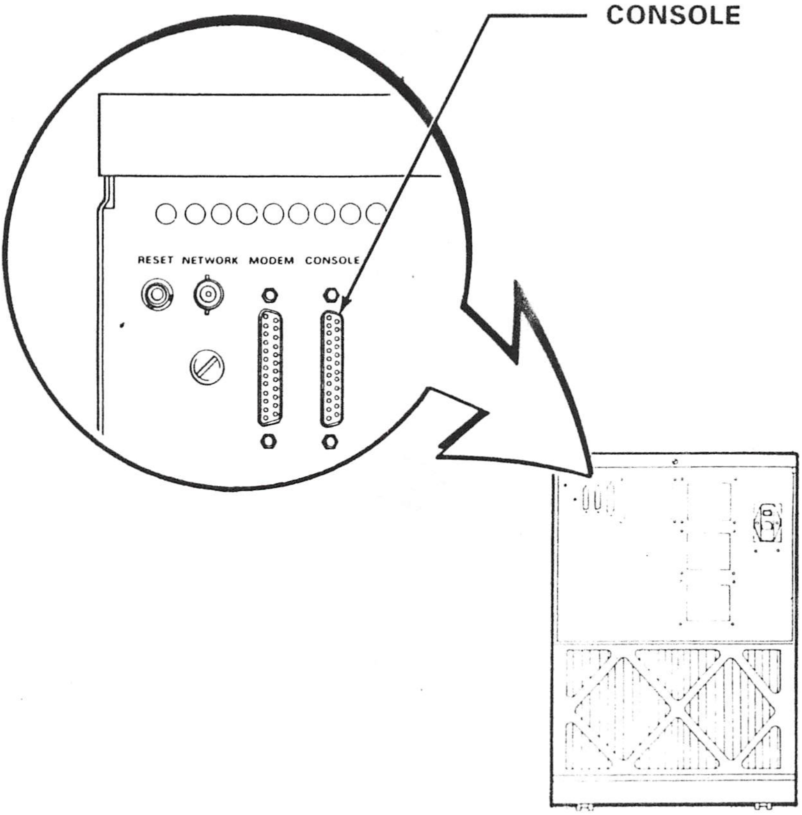
Insert the NIC or PIC in the proper slot. For IBM PCs, use any expansion slot.

The IBM NIC uses interrupt level 2. No other card can use this interrupt level. To allow another card to use level 2, see the *PLAN Series Network Installation Manual.*



CONNECTING A CONSOLE TO THE FILE SERVER CABINET

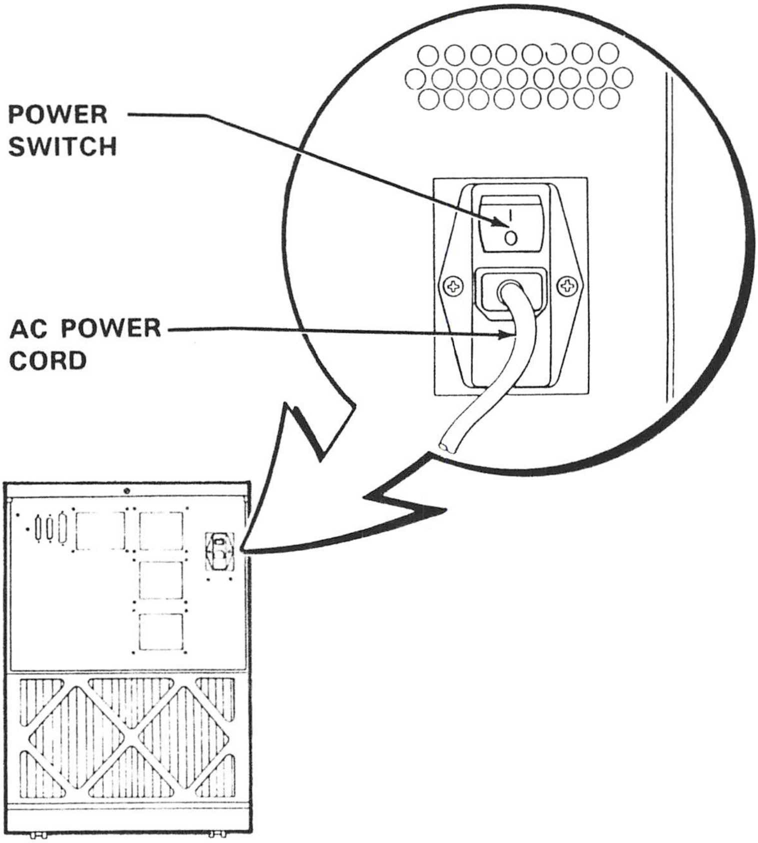
The file server cabinet has two standard RS232 connector ports in the rear. Plug the file server console into the RS232 port labeled "CONSOLE" on the backpanel. If you purchased your console from Nestar, any software switches in it are already set. If not, see the *PLAN Series Network Installation Manual* for switch settings.



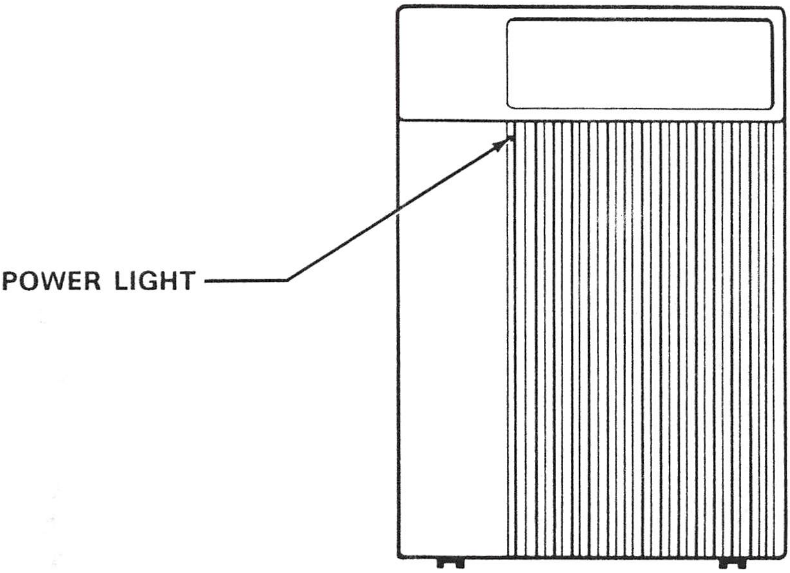
POWERING ON THE FILE SERVER

Plug the file server electric cord into a wall outlet. There is only one external AC power cord for each file server.

Warning: Under no circumstances operate the file server with its cover removed. High voltages are present within, and the file server fan will not cool the unit properly if the cover is not on.



Turn on the file server and the console. Does the power light come on? Does the fan start up? Does the disk spin? If not, contact your Nestar service representative.



Because there are no workstations connected to the file server, the console will beep. To stop the beeps, type

```
DISPLAY RECON OFF
```

CABLING THE NETWORK

The sections below describe how to design your network's layout.

Every workstation and server station must be cabled to a HUB.

Cable Placement and Cabling Rules

For more information on efficient cable placement and troubleshooting, refer to Chapter 2 of the *PLAN Series Physical Planning Manual.*

For more information on coaxial cabling, fiber optic cabling, and the IBM Cabling System, refer to Chapter 2 of the *PLAN Series Physical Planning Manual* and Appendix C of the *PLAN Series Network Installation Manual,*

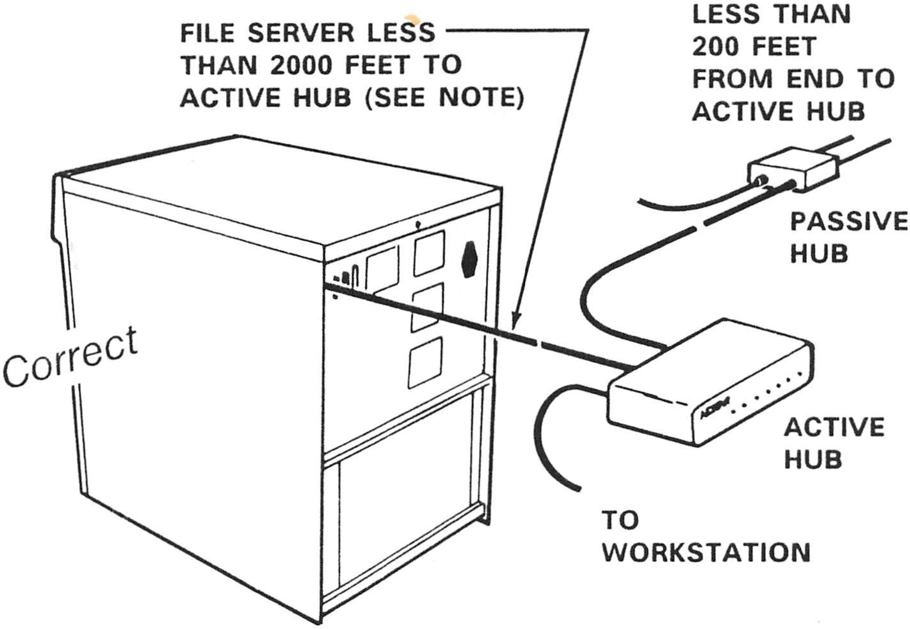
To cable stations to HUBs and HUBs to each other, observe the following rules.

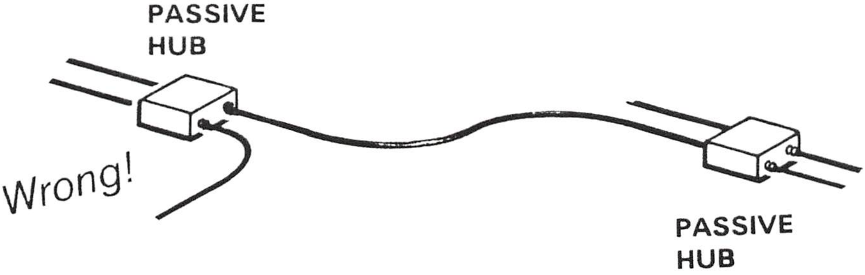
(1) User stations, servers, and HUBs can be connected in any topology without loops (that is, there must never be more than **one** cabled path from any station or HUB to any other HUB).

(2) Passive HUBs must not be connected to each other without an intervening active HUB.

(3) Coax cable lengths from file servers to active HUBs or between active HUBs can be up to 2000 feet. Fiber optic cable lengths can be up to 4000 feet. IBM Cabling System twisted pair cable lengths can be up to 1650 feet.

Note: If the file server has an optional Print Server Feature Card, the maximum cable length from the file server to an active HUB is 200 feet.


FILE SERVER LESS THAN 2000 FEET TO ACTIVE HUB (SEE NOTE)
LESS THAN 200 FEET FROM END TO ACTIVE HUB
PASSIVE HUB
Correct
ACTIVE HUB
TO WORKSTATION

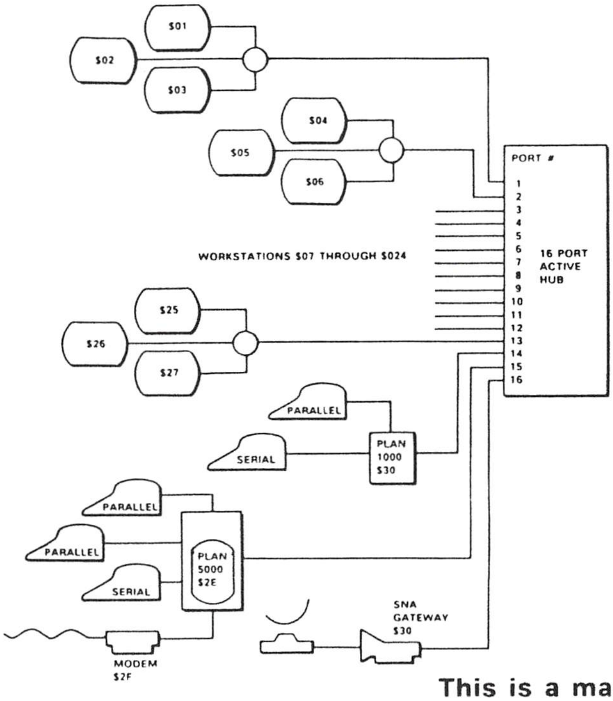


(4) No two nodes can be separated by more than ten HUBs (active or passive).

(5) No more than 200 feet of cable can be connected to a passive HUB; this includes cable to the passive HUB from active HUBs and from network stations. Cables for passive HUBs must not be coiled.

(6) All passive HUB ports with coaxial cable connected to them must be terminated by a resistor or by attachment to a node.

At installation time, draw a map of the network Each network workstation and server station has a unique address, as discussed in a previous section. In addition, cable runs can be given identification numbers. These addresses and ID numbers can be included on the map.



This is a map of the network illustration on pages 2 and 3

Walls, Floors, Ceilings

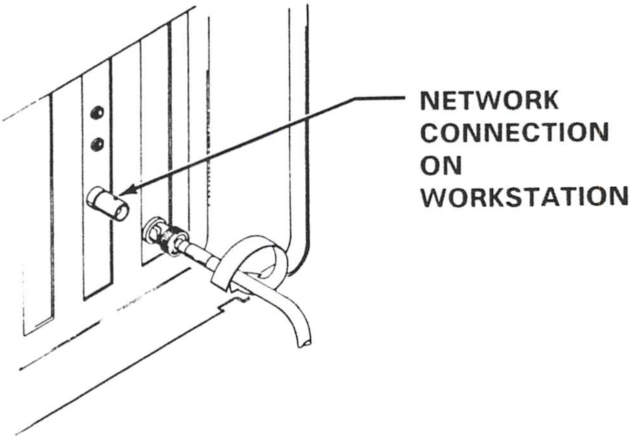
Cable can be run along walls, on floors (if a rubber mat is placed over the cable run to prevent employees from tripping over it), or in ceilings. Many installations use the ceilings for long cable runs. If your building has a false ceiling, this may be the most convenient location.

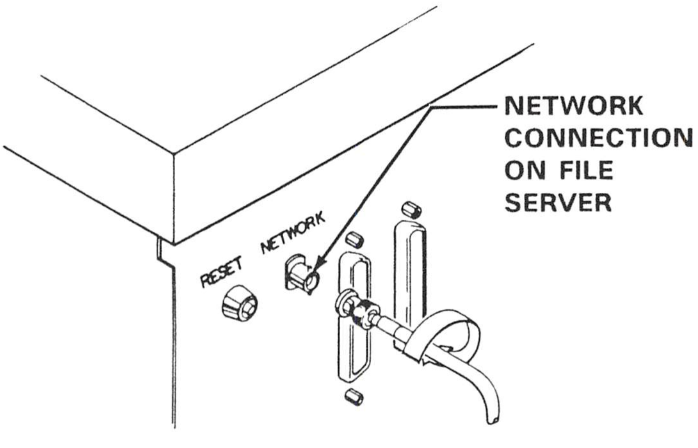
Coaxial cables are not designed for use in environments that will subject them to high pressure or constant flexing. In such environments, locate cable runs inside conduits, conduit troughs, or tunnels.

Connecting Workstations and HUBs

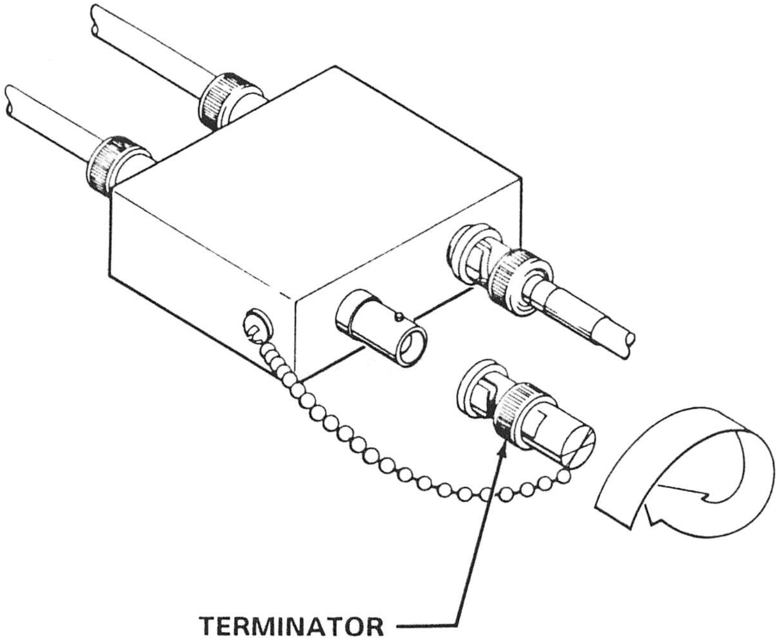
Cable all workstations to HUBs.

Attach one end of a length of network coaxial cable to the connector on the bracket on the rear of the user station, or to the network connector on the rear of the PLAN 5000.





Attach the other end of the cables to a HUB (active or passive).



CHECKING THE SYSTEM

Testing the File Server

To check for errors in the installation and configuration, bring up the file server **without** other stations connected to the network.

Until you have connected at least one (powered on) station to the file server, you may hear a regular series of beeps from the console; this is normal.

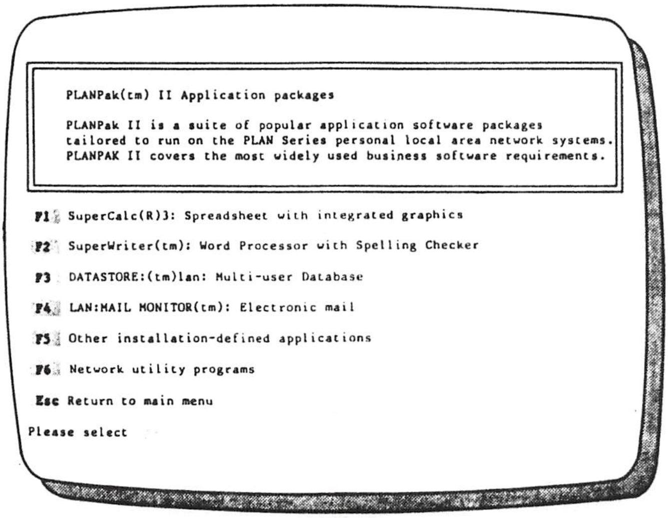
If the file server is operating correctly the following banner appears on the console:

```
  *****************************

***    NESTAR FILE SERVER      ***
***        VERSION 2.3d        ***

  *****************************

Copyright 1980, 1981,1982,1983
 Nestar Systems, Incorporated

  THUR 28-NOV-1985 13:05:56
```

User stations should be added to the network one by one.

Testing User Stations

Turn on a user station; the following menu should appear on the screen:



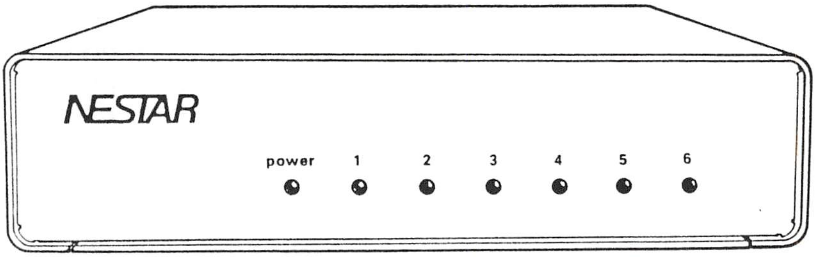
```
PLANPak(tm) II Application packages

PLANPak II is a suite of popular application software packages
tailored to run on the PLAN Series personal local area network systems.
PLANPAK II covers the most widely used business software requirements.

F1  SuperCalc(R)3: Spreadsheet with integrated graphics

F2  SuperWriter(tm): Word Processor with Spelling Checker

F3  DATASTORE:(tm)lan: Multi-user Database

F4  LAN:MAIL MONITOR(tm): Electronic mail

F5  Other installation-defined applications

F6  Network utility programs

Esc Return to main menu

Please select
```

On the active HUB to which the user station is attached, the light-emitting diode (LED) corresponding to the user station will come on and stay on if the connection is successful. (When the active HUB sees that a workstation is powered on, it turns on the LED. The LED will blink several times and then come on and stay on.)

Confirmation of communication with the network is seen if the boot process takes place successfully (i.e., if the workstation doesn't suspend activities during booting).

If network communication is **not** successful, make sure that the NIC in the user station has a valid address and then reset the board.

Connect all user station microcomputers in this way, one-by-one, confirming that each is attached to the network.



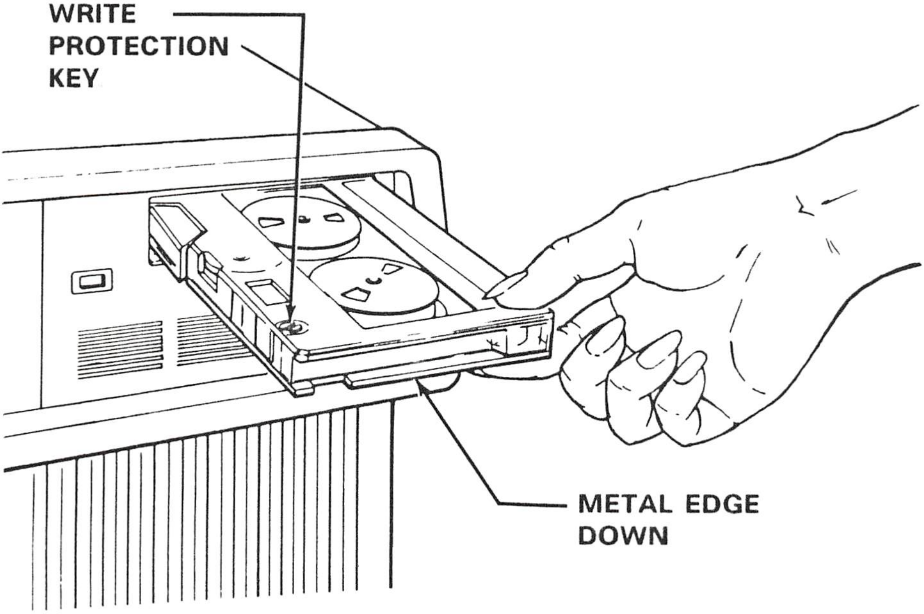
BACKING UP THE SYSTEM

A backup tape of system software is distributed with the system. To make further backups, see the "Partial Tape Dump/Restore" option in Chapter 4 of the *PLAN File Server Installation and Operation Manual*.

Inserting Tape Cartridges

Insert the tape cartridge metal-side down, label-side up, with the tape and drive wheel to the left. The cartridge must be inserted firmly or it will not lock in place. If it is oriented incorrectly when inserted, it will not lock in place.

To remove the tape, press the tape cartridge in firmly to unlock it. Pull out carefully to avoid damaging the tape.



OTHER SERVERS

For information on other servers refer to the following PLAN Series manuals:

PLAN 1000 Print Server Installation and Operation Manual

Print Server Feature Card Installation and Operation Manual

IBM PC Installation and Operation Manual

PLAN File Transfer Server Installation and Operation Manual

PLAN SNA Gateway Installation and Operation Manual

PLAN 3270 BSC Installation and Operation Manual

NOTES:

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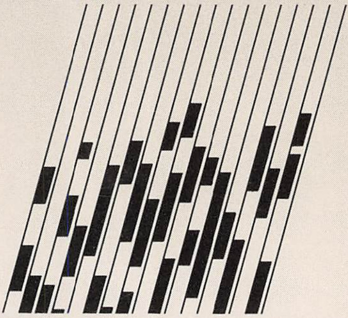

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